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THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

TOWNSHIP OF VAUGHAN

July, 1965

DIVISION OF SANITARY ENGINEERING
ONTARIO WATER RESOURCES COMMISSION

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REPORT ON

A

WATER POLLUTION SURVEY

OF THE

TOWNSHIP OF VAUGHAN

July, 1965

Division of Sanitary Engineering
Ontario Water Resources Commission

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REPORT ON A
WATER POLLUTION SURVEY
OF THE
TOWNSHIP OF VAUGHAN

INTRODUCTION

The purpose of this survey was to locate and record all significant sources of water pollution within the Township of Vaughan. Surveys of this nature are conducted routinely and upon request throughout the Province of Ontario by the Ontario Water Resources Commission as a basis for evaluating any existing or potential sources of pollution.

Recommendations are made pertaining to water pollution abatement, and the Commission expects that corrective measures will be taken by those concerned.

SUMMARY

A water pollution survey was made of the Township of Vaughan by the Ontario Water Resources Commission. Field investigations were made during the months of January, March, April and May.

It is noted that, in general, the main watercourses do not appear to be receiving severe deterioration. However, tributaries of these streams are degraded in certain urbanized areas of the township. In particular, creeks flowing through the following communities receive wastes of a polluting nature: Pine Grove, Kleinburg Estates and Maple. In addition, a piggery operated by Mr. R. Burbidge probably contributes oxygen

depleting wastes to a tributary of the East Branch of the Humber River.

It is suggested that the Police Village of Maple, Kleinburg Estates and Pine Grove are in need of a communal sewage works. There have been sewage disposal problems encountered in these areas which have resulted in or could result in the deterioration of the water quality in the local watercourses. The development of municipal sanitary sewerage systems for these areas should be considered prior to any future additional subdividing.

The municipal refuse disposal area is satisfactorily located but it is suggested that no liquid industrial wastes be disposed of at this site. Similar conditions would prevail for the privately owned and operated sanitary landfill site located immediately west of the municipal one.

The townships of North York and Etobicoke have indicated that there are two sites where they would like to establish sanitary landfill operations. These sites have been investigated and appear satisfactory providing certain precautions are taken. It should be noted that a site is deemed suitable or unsuitable by the Commission strictly from a ground and surface water perspective.

The sand and gravel companies located in the township that wash gravel are at the present time treating the waste water adequately.

RECOMMENDATIONS

1. The Township of Vaughan should locate and eliminate all

- the discharges of polluting wastes to the municipal storm sewers in the Police Village of Maple.
2. The owners of malfunctioning septic tank and subsurface tile field disposal beds in the Police Village of Maple should contact the York County Health Unit and perform the necessary corrective action under the Unit's supervision.
 3. The discharge of contaminating wastes from the tailrace formerly serving Hayhoe Pine Grove should be discontinued.
 4. Mr. R. Burbidge should take the necessary steps to prevent the discharge of polluting material from his piggery to the tributary of the East Branch of the Humber River.
 5. The development of a sanitary sewage works for Kleinburg Estates should be considered.
 6. Tank Truck Transport Limited should continue to exercise careful control of their waste disposal system.
 7. No liquid industrial wastes should be disposed of at the municipal or privately-owned sanitary landfill sites located on part of Lot 26, Concession 3.
 8. The Township of Vaughan should continue to expand its water pollution control programme.

GENERAL

The Township of Vaughan's physical area is 67,100 acres, and the assessed population in 1964 was 17,895. The township is bordered on the east and west by Highways 11 and 50 res-

pectively, and lies immediately north of Metropolitan Toronto. There exists sporadic urbanized growth, with the main part remaining rural.

WATER USES

Municipal - Township of Vaughan Water Works

The water works consists of five separate distribution systems each with its own source of supply. Seven wells supply water to these systems. With the exception of the Carrville well where only iron removal treatment is provided, the water from each well is treated for iron removal and chlorinated.

The chemical and bacteriological quality of the treated water appears to be satisfactory.

Private

Department of Lands and Forests - Southern Research Station

Water from three drilled wells is pumped to the treatment plant. Here the water is treated by aeration, settling and pressure filtration and is discharged to an underground storage reservoir. The water is pumped from the ground storage reservoir to an elevated storage tank and then flows by gravity to the distribution system.

The chemical and bacteriological quality of the water appears to be satisfactory.

Recreational - Boyd Conservation Area

The principal recreational use of water is at the Boyd Conservation Area operated by the Metropolitan Toronto and Region Conservation Authority.

DRAINAGE

The Township of Vaughan lies entirely in two main watersheds, namely the Humber River Watershed and the Don River Watershed. These main watersheds may be further subdivided as follows:

(a) Humber River Watershed - Humber River
Black Creek

(b) Don River Watershed - Don River
West Don River

The rivers all reach an outlet at Lake Ontario after traversing Metropolitan Toronto and, in the case of the Don, a section of the Township of Markham.

Storm sewers are provided for portions of the urbanized areas of the Township while the remainder relies on open ditches.

SEWAGE DISPOSAL

Municipal - West Don Water Pollution Control Plant

Concord, an industrial area located east of Keele Street, is serviced by the West Don water pollution control plant. The remainder of the municipality achieves sewage disposal by means of private systems.

The West Don plant uses the conventional activated sludge process and provides tertiary treatment by means of a waste stabilization pond. The plant received initial waste flows during the month of November, 1964. The plant has not reached equilibrium with respect to operation, and, therefore, any attempt to evaluate the efficiency of treatment would be premature.

Private

Department of Lands and Forests - Southern Research
Station

The water pollution control plant serving the Southern Research Station of the Department of Lands and Forests is a Rated Aeration Plant, manufactured by the Chicago Pump Company. It consists of a comminutor, aeration section, final settling tank, sludge storage tank and chlorine contact chamber. The aeration and final settling tanks are enclosed by a wire screen to prevent the entrance of leaves and small animals.

Flows to the plant vary from approximately 2,000 gallons per day to 11,000 gallons per day.

The Commission's objectives of 15 ppm of 5-Day BOD and suspended solids in the plant effluent are generally met. Satisfactory chlorine residuals are usually being maintained in the final effluent.

GRAVEL WASHING PLANTS

A number of sand and gravel operations exist in the municipality and those that wash gravel were inspected. The purpose of investigating the gravel washing operations was to determine if the waste water was being adequately treated prior to discharge to a watercourse. The washing wastes should not be discharged directly to a watercourse because of the high suspended solids content.

Monarch Sand and Gravel Company

The above company is located on the east part of lots 17 and 18, Concession No. 9 in the Township of Vaughan. The owner is Mr. J. Short. Gravel is extracted below the water table re-

sulting in water ponding in the pit. The water for the gravel washing machine is obtained from this pit. The waste water is discharged to a depressed area located south-east of the plant. The overflow from this area drains to the Humber River.

At the time of the last OWRC inspection on March 17, 1965, there was no gravel washing being performed. The overflow from the depressed area was observed and appeared free of suspended solids and otherwise aesthetically attractive.

Connor Transport Limited - Sand and Gravel Division

Connor Sand and Gravel is located on the west side of Highway No. 27 just south of Kleinburg. Gravel washing is performed at times of favourable weather conditions. The waste water is discharged to settling ponds which operate in series. There were no wastes being discharged to a watercourse from the ponds at the time of the last OWRC inspection on March 17, 1965.

Superior Sand, Gravel and Supplies Limited

This firm is located on the north side of the Maple Side Road immediately east of the community of Maple. Water for gravel washing purposes is obtained from a pond reservoir located at the south-east corner of the property. A deep drilled well is used as an additional source of water supply. The waste washing water is pumped to three settling ponds connected in series and located west of the gravel washing plant. The effluent from the final pond discharges to the reservoir. The system is a complete recirculating one with no effluent discharge to a watercourse.

SOURCES OF POLLUTION

This section of the report reviews sources of pollution located at the time of the survey and, in addition, any previously known sources of pollution.

Municipal

Community of Pine Grove - Sewage disposal in this area is effected by means of private sewage disposal systems. There have been a number of malfunctioning septic tank and subsurface tile field units located by the York County Health Unit and the OWRC. The owners were requested by the health unit to make the necessary corrections and this work has been carried out.

The main source of pollution originates from a tailrace formerly serving Hayhoe Pine Grove, a flour mill. The mill race is no longer in use and as a result, the main function of the tailrace is to provide drainage for ground and surface runoff water.

While all the known discharges of wastes to this tailrace have been eliminated, it still remains a source of odours and pollution. The tailrace effluent discharges to the East Branch of the Humber River. Because the tailrace is open for the greater part, organic material is deposited in it naturally and by the local residents. The putrefaction of the organic material causes the water in the tailrace to deteriorate. Therefore, it is suggested that the tailrace be tiled and backfilled for its entire length.

Kleinburg Estates - A survey was conducted of this area by the York County Health Unit and the OWRC. A number of mal-

functioning septic tank and subsurface tile field systems exist in this subdivision and all efforts by the people involved have failed to produce a satisfactory solution. Wastes characteristic of septic tank effluent were noted lying exposed on the ground surface and in the drainage ditches. A water pollution problem may result at times of severe surface run-off conditions but for the most part the wastes seep into the ground prior to reaching a watercourse.

Police Village of Maple

The ultimate solution to problems of sewage disposal in the subdivision appears to be a communal sewage disposal system. Pollution problems in the Police Village of Maple result from faulty septic tank and disposal beds and connections to municipal storm sewers. Raw domestic sewage and septic tank effluent are discharged to a watercourse that rises in the north-east section of Maple and flows in a southerly direction through the community to its confluence with the West Don River. The OWRC investigation on April 22, 1965, located two sources of pollution. They were:

(1) Septic tank effluent from the residence of Mr. H.C. Miller at 5 Keele Street South that was observed discharging to the watercourse;

(2) A four-inch diameter conduit carrying raw sewage to the stream. The drain is situated approximately 100 feet south of Railway Street and 100 feet east of Cousin's Lane.

It is suggested that where wastes are being discharged to a municipal drain, the Township of Vaughan should locate and eliminate the source. The individual owners of malfunc-

tioning sewage disposal systems should contact the York County Health Unit and seek direction as to the proper procedure to follow.

In addition, the watercourse should be cleared of debris and all flow restrictions removed.

Private

Tank Truck Transport Limited - In May of 1962, a fish kill that occurred in the upper reaches of the Black Creek was investigated by the OWRC. The source of the responsible contaminant appeared to be the lagoon serving the Tank Truck Transport Limited located on Costa Road. The latter runs south of Highway No. 7, approximately 0.5 miles east of Jane Street.

This company has a licence to haul bulk products in tanks and maintains a repair depot and terminal. The trucks haul a variety of cargoes, among which are cyanide pellets, polyethylene pellets, glycerine and edible oils.

It was reported that the interiors of the tanks on the trailers are washed with an alkaline solution and then rinsed with hot and cold water. The tank truck washings are discharged to a lagoon which is located south of the building. The material in the lagoon possessed a reddish tinge.

Sanitary wastes from the premises are disposed of by means of a private septic tank system.

A routine investigation was made of the industry on March 22, 1965, and Mr. R. Malbeuf, Manager, was interviewed. The operation of the lagoon appeared satisfactory as there were no wastes being discharged at this time.

Careful supervision is required of the waste disposal facilities at this industry to ensure that pollutant and toxic chemicals are not discharged to the watercourse. To facilitate the proper control, inspections of the ditches in the vicinity of the lagoon should be made on a routine basis by the company.

Canadian National Railways Toronto Yard - The Canadian National Railways Toronto Yard is a freight classification yard located north of Highway No. 7 and immediately west of Keele Street. Sanitary sewage from the yard is directed to the West Don sewage treatment plant. Storm drainage is effected by means of storm sewers and open ditches that carry the flow to the West Don River.

Burbidge Piggery - Mr. Russel E. Burbidge operates a piggery that is located on Lot 31, Concession 5, in the Township of Vaughan. There are approximately 300 pigs that are swill and dry fed. The operation is primarily a dry one as the pens are prepared with shavings. A portion of the piggery wastes are allowed to seep into the ground while the remainder flows via a 12-inch corrugated iron pipe to a tributary of the East Branch of the Humber River. At the time of the OWRC inspection on April 22, 1965, no wastes were observed discharging from the pipe. Manure from the pens is piled on the ground surface near the creek.

Water for the pigs is obtained from a pond created by a dam on the creek. Reportedly all the flow in the stream is retained during the summertime.

The watercourse could receive oxygen depleting wastes

from the operation. The waste discharge and the manure pile locations should be controlled so that they do not affect the water quality of the creek.

REFUSE DISPOSAL

Existing

The Township of Vaughan operates a waste disposal site located on part of Lot 26, Concession 3. The site has dimensions of approximately 850 feet square.

Adjacent to the westerly boundary of the township disposal site is another waste disposal site operated by the Sanitary Landfill Company. The waste materials appeared to be mainly domestic.

Dumping operations at the municipal disposal site are being undertaken along the pit bottom which is located approximately 80 feet lower than the elevation of the adjoining sideroad. The waste materials were largely household refuse in nature. However, considerable quantities of liquid industrial wastes have been dumped at the site by the R. Bremner Company Limited with the approval of the township. These wastes are mainly in the form of pickle liquors containing copper, and minor quantities of caustic stripping liquids and oil refinery wastes.

The municipality requested that the OWRC investigate the possibility of such materials reaching ground-water aquifers and thus polluting water supplies. In particular, the township was concerned about the possible pollution to the Police Village of Maple municipal supply by the dumping of

liquid industrial wastes at the municipal disposal site.

A ground-water investigation was conducted on December 15, 1964, by the Ground Water Branch of the Commission to determine if present disposal practices at the township waste disposal site could adversely affect the quality of the ground water.

The area was researched hydrologically and geologically. Located to the east and north-east of the Police Village of Maple is an extensive highland region, called the Oak Ridges interlobate moraine, which consists largely of interbedded clays, sands, silts, gravels and till and is a major source of ground-water recharge. Several sand and gravel pits are located along the moraine in the Maple region. The pits extend from Lot 21 to Lot 26, Concession 3, Township of Vaughan. The police village is situated within a levelled till plain composed essentially of a clayey to silty till with some interbedded sands and gravels that form the water-bearing horizons of the area.

A study of the logs of drilled water wells indicated that a hydraulic connection with the same moraine does appear to exist, as exemplified by the continuity of the water-bearing horizons and the relative elevations of the static levels. Several flowing wells are present in the immediate area.

The Maple municipal well flowed at the time of construction. The well obtains water supplies from a 12-foot thick sand and gravel horizon at a depth of 72 feet below the top of the casing at a pumping rate of 355 gpm. It is possible

that the area of influence of the well may extend several thousand feet and encompass the Township of Vaughan disposal site.

It is probable that some portion of the liquid compounds and solutions in the industrial wastes may infiltrate under the influence of gravity to the water table and then move with the water in the direction of ground-water flow.

Some neutralization of the wastes may occur by chemical reaction with the overburden, the degree of which is essentially dependent upon the chemical compositions of the overburden and the wastes and the duration of contact. Some dilution could also be expected within the ground-water environment, increasing with distance from the point of disposal.

The solids in the various wastes or those which precipitate due to chemical reaction will likely be filtered from the liquid wastes by passage through the overburden.

As the possibility of pollution to the Maple municipal ground-water supply does exist, it was concluded that liquid industrial wastes should not be dumped at the township or Sanitary Landfill Company sites. It appears that wastes such as sludge, dry industrial wastes, properly neutralized acids and household refuse could be safely dumped at these disposal areas.

Proposed

Township of North York Proposal - Sanitary landfill operations are proposed by the Township of North York in an abandoned borrow pit in Lot 2, Concession 5, Township of Vaughan. The borrow pit is pear-shaped, with a longitudinal

dimension in a north-south direction of approximately 1,000 feet, a maximum width of approximately 600 feet and a reported depth of approximately 15 feet. A C.N.R. by-pass cut, approximately 150 feet wide and with a maximum depth of about 20 feet, borders the south end of the pit.

A survey of this area was performed on January 25, 1965, by the Ground Water Branch of the Commission. The survey was conducted shortly after a period of thaw and heavy rain, and the water in the pit was within five feet of the ground level. No seepage was observed along the banks of the railway cut in the vicinity of the proposed site. The drainage ditch on the north side of the railway cut and nearest the pit was dry.

The overburden, as visible along the banks of the pit and the railway cut, consists of a stony, silty till.

Residences adjacent to the pit were visited to obtain well data. The elevations of the reported and observed water levels in the dug wells indicate that the direction of movement of ground water under water-table conditions is to the south-west. The water levels of drilled wells in the vicinity appear to decrease at a depth suggesting that the site may be in a recharge zone where some downward movement of ground water could be expected.

It is likely that much of the bacterial and organic pollutants in the liquids infiltrating from landfill would be removed within a short distance by filtration. In addition, natural die-off of bacteria and oxidation of organic materials could be expected. The concentration of chemical pollutants may be reduced by adsorption and chemical reaction with the

overburden and dilution and dispersion with ground water.

Township of Etobicoke Proposed Sanitary Landfill Site -

Sanitary landfill operations are proposed by the Township of Etobicoke in a triangular-shaped site of approximately 19 acres at Lot 1, Concession 7, in the Township of Vaughan. This property is situated on the north side of Steeles Avenue, within the CN borrow pits, immediately east of Martin Grove Road. Surface runoff water from the area is toward Rainbow Creek which is a tributary of the Humber River.

The proposed site appears to be suitable for the purpose intended providing that the surface runoff water that normally drains into the borrow pit is diverted away from this area. If the surface runoff water entering the south-west corner is directed along the south side of the tracks instead of the north side, provision would have to be made to prevent seepage from the landfill area entering this ditch. This would likely involve the construction of an impervious earthen dike separating the ditch from the dumping area.

A survey will be conducted by the Ground Water Branch to determine the suitability of the site for the disposal of industrial wastes with respect to ground water.

TOWNSHIP OF VAUGHAN WATER POLLUTION CONTROL PROGRAMME

Recently the township has instituted a new industrial waste by-law and appointed a pollution control officer. These are steps which are invaluable in water pollution prevention practices. It is suggested that the Township of Vaughan con-

tinue and expand this programme.

DISCUSSION OF LABORATORY RESULTS

Samples have been collected from the watercourses and sources of pollution in the township. The laboratory results have been tabulated and are appended to this report.

The chemical and bacterial quality of the main watercourses was, in general, satisfactory. However, a number of tributaries of these main streams receive polluting wastes that deteriorate the water quality in the immediate area.

At Maple there are oxygen depleting and poor bacterial quality wastes being discharged to the watercourse that drains the eastern section of Maple and is a tributary of the West Don River. A sample collected at sampling point DWM-23.5 downstream from Richmond Street, indicated that a BOD of 9.6 ppm, which is in excess of the OWRC's maximum objective of not greater than 4 ppm for 5-day BOD, existed. The sample collected for bacteriological examination revealed that 8,300,000 coliform organisms per 100 ml. were present. This greatly exceeds the Commission's maximum objective of not greater than 2,400 coliform organisms per 100 ml. Samples collected from sampling point HEK-22.1, the drainage from the Kleinburg Estates Subdivision, indicate that the 5-day BOD of 6.9 ppm was within the Commission's maximum objective of not greater than 15 ppm. The bacteriological examination of the sample revealed a concentration of coliform organisms of 260,000

per 100 ml. which could indicate the presence of sanitary sewage.

All of which is respectfully submitted,

District Engineer J.C. McLellan
for H. Browne

Approved by J. R. Barr, Assistant Director

Prepared by: D.A.M. Wilson

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Appendix A

GLOSSARY OF TERMS

Bacteriological Examinations - The Membrane Filter technique is used to obtain a direct enumeration of coliform organisms. These organisms are the normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large numbers in sewage and are, in general, relatively few in number in other stream pollutants. The results are reported as M.F. coliform count per 100 millilitres.

Biochemical Oxygen Demand (BOD) - The BOD test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in the sewage, sewage effluent, polluted waters or industrial wastes by aerobic biochemical action. The time and temperature used are 5 days and 20°C respectively.

Freshet - a flood or overflowing of a river caused by heavy rains or melted snow.

Gallon - denotes Imperial gallon unless otherwise noted.

Hydrogen Ion Concentration (pH) - The hydrogen ion concentration (pH value) of a water indicates its relative acidity or alkalinity. It is a measure of intensity rather than of quantity. A neutral water has a pH of 7.0. Higher values are in the alkaline range and the lower in the acid range.

Oils and Ether Soluble Materials - These include oils and all other ether soluble materials such as tarry substances and greases. The presence of these pollutants renders water difficult and sometimes impractical to treat, either for industrial or domestic use. Oils make the stream unsightly and the water unfit for bathing. They coat water craft and are a hazard to wild fowl.

Phenolic Compounds - Phenols and phenolic equivalents were measured by the Gibbs Method with modifications. Phenols react with chlorine to produce intensely aromatic compounds. These compounds, even when highly diluted, may give a taste and odour to the water which is variously described as medicinal, chemical or iodoform. Phenols taint fish and are toxic to fish, depending on the concentration. Normal water contains no phenolic compounds.

Solids - The analyses for solids include tests for total, suspended and dissolved solids. The former measures both the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature, whereas the dissolved solids are a measure of those solids in solution.

Appendix A (cont'd)

Turbidity - Turbidity is a measure of the fine suspended solids in water such as silt and finely divided organic matter. Where suspended solids values approach 20 parts per million or less, the results are usually reported as turbidity in silica units.

Water Quality and Effluent Objectives - The desirable objectives for all surface waters in the Province of Ontario are as follows:

5-Day BOD	- not greater than 4 ppm
M.F. Coliform Count Median Value	- not greater than 2,400 per 100 ml.
Phenolic Equivalents - average	- not greater than 2 ppb
- maximum	- not greater than 5 ppb
pH Range	- 6.7 to 8.5

A few pertinent maximum concentration limits of contaminants in storm sewers, sewage treatment plant and industrial waste effluents are listed below. It is noted that adequate protection for surface waters, except in certain specific instances influenced by local conditions, should be provided if the following concentrations and pH range are not exceeded.

5-Day BOD	- not greater than 15 ppm
Suspended Solids	- not greater than 15 ppm
Phenolic Equivalents	- not greater than 20 ppb
Ether Solubles (oil)	- not greater than 15 ppm
pH Range	- 5.5 to 10.6

Laboratory Results

Appendix B

Sampling Point No.	Location and Description	Date Examined or Sampled	5-DAY BOD	S o l i d s			Turbidity in Silica Units	M.F. Coliform Count per 100 ml.
				Total	Susp.	Diss.		
DEC-24.0 T	Ontario Department of Lands and Forests Southern Research Station Sewage Treatment Plant final effluent	Dec. 16/63	4.0	360	2	358		
		Oct. 15/63	6.0	454	26	428		
		Nov. 15/63	8.4	508	6	502		
		Sept. 13/63	4.0	588	16	572		
		Jan. 16/64	15	488	33	455		
		Jan. 17/64	6.8	460	24	436		
		Feb. 17/64	6.8	482	7	475		
		March 9/64	6.4	420	17	403		
		April 15/64	5	452	7	445		
		May 15/64	3.8	412	16	396		
		June 15/64	2.2	336	5	331		
		July 8/64	8.4	426	8	418		
		July 15/64	3.2	398	3	395		
		Aug. 17/64	4.0	372	2	370		
		Sept. 15/64	5.8	370	16	354		
		Oct. 15/64	7.2	352	8	344		
		Nov. 16/64	2.8	354	2	352		
		Dec. 15/64	11	442	38	404		
		Jan. 15/65	8	434	21	413		
		Feb. 1/65	9.2	358	15	343		
		Feb. 15/65	8.0	422	26	396		
		March 15/65	9.0	326	16	310		
		May 17/65	4.0	398	6	398		
DET-18.9 W	Corrugated iron storm sewer on the east side of Brooke St. south of Centre St. (Thornhill)	April 22/65		No flow noted				
		March 22/65		No flow noted				

Appendix B (cont'd)

<u>Sampling Point No.</u>	<u>Location and Description</u>	<u>Date Examined or Sampled</u>	<u>5-DAY BOD</u>	<u>S o l i d s</u>			<u>Turbidity in Silica</u>	<u>M.F. Units</u>	<u>Coliform Count per 100 ml.</u>
				<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>			
DW-18.2 T	West Don Water Pollution Control Plant final effluent	Feb. 2/65	4.3	550	6	522			
		April 21/65	37	1,838	7	1,831			
		April 29/65	20	1,966	32	1,934			
		May 31/65	11.4	2,454	25	2,429			
		May 25/65	32	2,196	44	2,152			
DW-21.1	West Don River at Langstaff side road just east of Keele Street	March 22/65	2.5	554	11	543			66
		April 21/64	3.6	570	17	553			15,000
		May 21/63	1.8	534	-	-	6.5		130
		June 19/62	2.3	394	-	-	45		1,500
DWM-23.7	Maple Creek just north of Railway St.	April 22/65	7.2	770	28	742			5,600
HET ₁ B-25.6	Watercourse upstream from the Burbidge Piggery	April 22/65	10	774	38	736			3,800
HET ₁ B-25.4	Watercourse downstream from the Burbidge Piggery	April 22/65	8.4	730	40	690			3,700
HB-16.5	Black Creek at Steeles Avenue West and Jane St.	Oct. 15/64							28,000
		Sept. 15/64							900
		May 19/64							800
		May 9/63	2.9	530	-	-	5.0		1,500
		June 27/62	6.2	454	-	-	38		5,000
DW-17.8	West Don River at Steeles Ave. West	March 22/65	4.2	674	19	655			1,900

Appendix B (cont'd)

<u>Sampling Point No.</u>	<u>Location and Description</u>	<u>Date Estimated or Sampled</u>	<u>5-Day BOD</u>	<u>S o l i d s</u>			<u>Turbidity in Silica</u>	<u>M.F. Units</u>	<u>Coliform Count per 100 ml.</u>
				Total	Susp.	Diss.			
DE-22.7	East Don River at Carrville Rd.	March 22/65	2.0	362	14	348			400
DE-22.1 W	Concrete storm sewer north of Carrville Rd. immediately east of the Township of Vaughan Water Works (Carrville well)	April 22/65 March 22/65	No flow noted No flow noted						
DEG-26.0	German Mills Creek at Brookside Drive	April 20/64 May 21/63 June 19/62	1 1.8 2.2	296 430 338	3 - -	293 2.5 8.0			108 2,220 4,100
DE-21.6 W	30 inch concrete storm sewer west of Maryvale Cres. just north of Bryson Avenue	April 22/65 March 26/65	No flow noted 1.0	440	25	415			310
DE-21.5 W	30 inch corrugated iron storm sewer west of Westwood Lane	April 22/65	No flow noted						
DEC-21.7	Carrville Creek at Bathurst St.	March 22/65 April 20/64 May 21/63 June 19/62	1.8 1.5 1.9 1.2	310 320 326 286	14 9 - -	296 311 5.5 5.5			1,900 7,500

Appendix B (cont'd)

<u>Sampling Point No.</u>	<u>Location and Description</u>	<u>Date Examined or Sampled</u>	<u>5-Day BOD</u>	<u>S o l i d s</u>			<u>Turbidity in Silica Units</u>	<u>M.F.</u>	<u>Coliform Count per 100 ml.</u>
DE-22.1	East Don River at Carrville Rd.	March 22/65	2.5	554	11	543			66
		April 20/64	1.8	360	8	352			800
		May 21/63	1.9	394	-	-	12.0		4,300
		June 19/62	1.2	274	-	-	9.5		73,000
DE-19.4	East Don River at Highway No. 11 (Thornhill)	March 23/65	3.6	430	16	414			11,300
		April 20/64	2	374	5	369			1,300
		May 21/63	2.4	378	-	-	4.0		3,400
		June 19/62	2	336	-	-	13.0		4,000
DE-19.9 W	30 inch corrugated iron storm sewer west of Uplands Ave.	April 22/65 March 24/65	No flow noted						
DE-20.3 W	30 inch corrugated iron storm sewer west of Longbridge Rd.	April 22/65	No flow noted						
DW-23.5 W	20 inch concrete storm sewer west end of Lancer Dr. (Maple)	April 22/65 March 22/65	No flow noted No flow noted						
DWM-23.4 W	30 inch concrete storm sewer east of Lancer Drive (Maple)	April 22/65 March 22/65	No flow noted No flow noted						
DWM-23.6	Maple Creek at the south side of Richmond Street	April 22/65 July 6/64	12.6 23	768 390	10 17	758 373			700,000 170,000
DWM-23.5	Maple Creek 150 feet downstream from Richmond Street	April 22/65	9.6	814	14	800			8,300,000

Appendix B (cont'd)

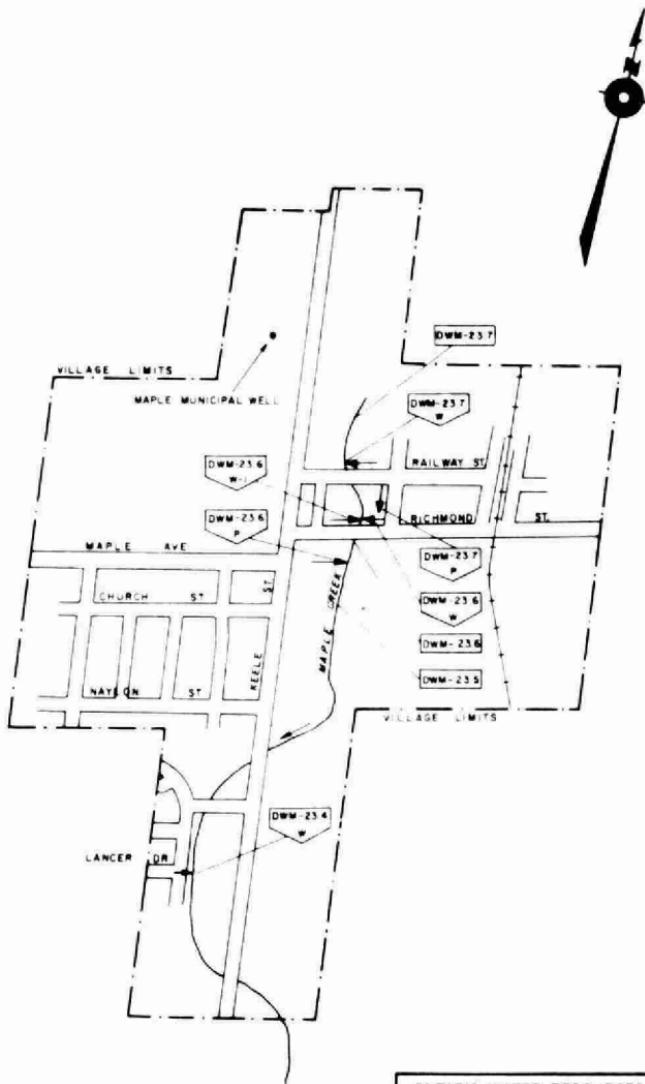
<u>Sampling Point No.</u>	<u>Location and Description</u>	<u>Date Examined or Sampled</u>	<u>5-Day BOD</u>	<u>S o l i d s</u>	Turbidity in Silica	M.F. Count	Coliform per 100 ml.
			Total	Susp.	Diss.	Units	
DWM-23.6 W-1	Storm sewer north side of Richmond St. west bank of Maple Creek	April 22/65		No flow noted			
DWM-23.6 P	Septic tank effluent from 5 Keele St. South	April 22/65		Flow noted sample collected downstream			
DWM-23.7 W	Storm sewer north side of Railway St. July 6/64 east bank of Maple Creek	April 22/65	No flow noted	27	488	88	400
		July 6/64					320,000
DWM-23.7 P	4 inch tile private drain 100 feet south of Railway Street and 100 feet east of Cousins Lane	April 22/65	No flow noted	420	1,446	386	1,060
		July 6/64					5,000,000
DWM-23.6 W	Storm sewer on the north side of Richmond St. east bank of Maple Creek	April 22/65	No flow noted				
HET ₁ B-25.5 P	Corrugated iron outfall from Burbidge Piggery to small watercourse	April 22/65	No flow noted				
HET ₁ B-25.5 P-1	Corrugated iron outfall from Burbidge Piggery to small watercourse	April 22/65	No flow noted				

Appendix B (cont'd)

<u>Sampling Point No.</u>	<u>Location and Description</u>	<u>Date Examined or Sampled</u>	<u>5-Day BOD</u>	<u>S o l i d s</u>			<u>Turbidity in Silica</u>	<u>M.F.</u>	<u>Coliform Count per 100 ml.</u>
				<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	<u>Units</u>		
HET _W 1B-25.5	Concrete Highway storm sewer	April 22/65		No flow noted					
HE-24.0	East Branch of the Humber River at the Kleinburg Sideroad	March 22/65 Sept. 23/64 May 9/63 June 27/62	1.6 0.7 2.6 0.5	322 294 396 284	10 29 - -	312 265 - -		16 470 23 10	
HE-28.6	East Branch of the Humber River at the King-Vaughan town line	March 22/65 Sept. 23/64 May 9/63 June 27/62	1.8 1.1 2.6 1.3	320 286 484 280	6 7 - -	314 279 - -	5.5 45 11.5	62 10,000 2,800 280	
H-24.4	Humber River at Highway No. 27 just south of Kleinburg	March 22/65 Sept. 22/64 May 9/63 June 27/62	1.7 0.7 2.7 1.4	326 284 304 302	13 21 - -	313 263 - -	18 9.0 13.0	600 610 92 90	
HEK-22.1	Drainage from Kleinburg Estates south of Sevilla Blvd.	May 10/65	6.9	338	22	316			260,000
HEK-22.1 W-1	Concrete storm sewer east of Sevilla Blvd.	May 10/65		Flow collected in HEK-22.1 sample					
HEK-22.1 W	Concrete storm sewer 100 feet south of Camlaren Crescent	May 10/65		Flow collected in HEK-22.1 sample					

Appendix B (cont)

Sampling Point No.	Location and Description	Date Examined or Sampled	S o l i d s			Turbidity in Silica Units	M.F. per 100 ml.	Coliform Count
			5-Day BOD	Total	Susp.			
HEK-22.3	Concrete storm sewer 50 feet east of Camlaren Cres.	May 10/65	No dry weather flow noted					
H-16.6	Humber River at Highway No. 7	Sept. 23/64 May 9/63 June 27/62	0.6 3.0 4.4	304 372 580	25 - -	279 - -	13.5 12.5 240	60,000 390 11,000
HR-16.9	Robinson Creek at Highway No. 7	March 22/65 Nov. 24/64 Sept. 23/64 May 9/63 June 27/62	4.0 12 7.6 2.9 225	396 690 616 498 3,126	21 34 15 - -	375 656 601 - -	9.0 3.1 200	11,400 126,000 440,000 8,700 10,000
H-17.5	Humber River downstream from Hayhoe Pine Grove tailrace	May 3/65	1.6	324	4	320		30
H-17.7 D	Hayhoe Pine Grove tailrace at the mill	May 3/65 May 21/64 Nov. 29/64	1.6 17 13	976 1,118 1,034	14 210 67	962 908 967		1,000 30,000 10,500
H-17.6 D	Hayhoe Pine Grove tailrace just above confluence with the East Br. of the Humber River	May 3/65 May 21/64 Nov. 29/62	28 26 80	966 1,034 1,160	36 54 42	930 980 1,118		850 690,000 7,500
H-17.6	Humber River upstream from Hayhoe Pine Grove tailrace	May 3/65	1.3	336	4	332		30
HE-18.8	East Branch of the Humber River at first sideroad above Pine Grove	March 22/65 Sept. 24/64 May 9/63 June 27/62	1.3 0.3 2.0 1.5	338 304 420 284	9 2 - -	329 302 - -	7.0 34 3	42 350 11,000 9



DWM-237 SAMPLING POINT SHOWING STREAM AND MILEAGE

DWM-234 STREAM AND MILEAGE AT OUTFALL
TYPE OF OUTFALL

- D — DRAIN OR DITCH
- P — PRIVATE SEWER
- W — STORM SEWER

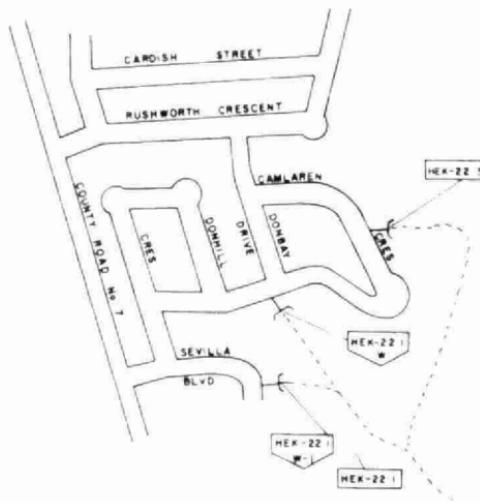
ONTARIO WATER RESOURCES COMMISSION

POLICE VILLAGE OF MAPLE

SCALE NOT TO SCALE

DRAWN BY H.S. DATE JULY, 1965

CHECKED BY R.W. DRAWING NO. 65-93



[HEK-22 1] SAMPLING POINT SHOWING STREAM AND MILEAGE

[HEK-22 2] STREAM AND MILEAGE AT OUTFALL
TYPE OF OUTFALL

- D — DRAIN OR DITCH
- P — PRIVATE SEWER
- W — STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

KLEINBURG ESTATES

SCALE NOT TO SCALE

DRAWN BY H.G.

DATE JULY 1985

CHECKED BY R.W.

DRAWING NO. 65-94

TOWNSHIP OF KING

TOWNSHIP OF KING

TOWNSHIP OF ALBION



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